

1, 2 y 3  
Octubre  
2024

## Concreto lanzado Principios, diseño y aplicaciones

Tres días de sesiones de entrenamiento en línea

### Sprayed concrete – Principles, design and applications Online three day training sessions

El objetivo de esta sesión es presentar una visión general del desarrollo y uso del concreto lanzado en la excavación de túneles en suelo y roca. El curso proporcionará toda la información necesaria para un buen diseño, control de calidad y aplicación del concreto lanzado con referencias a interesantes casos de estudio. Asimismo, se destacarán las últimas mejoras en equipos y tecnología de lanzado de concreto. También se abordarán los detalles para la certificación de los operarios de concreto.

The objective of this training session is to present a global overview of the development and use of sprayed concrete in soil and rock tunnelling. The training will provide all the necessary information for a good design, quality control and application of sprayed concrete with references to interesting case studies. The course will highlight the latest improvements in spraying equipment and technology. Certification issues for nozzle men will be also presented.



AMITOS



## Inscripciones • Inscriptions

	Cuotas (\$ MXN (+IVA))	Fees (\$ USD (+tax))
No socio   Non-member	\$2,850	\$142
Socio*   Member*	\$1,850	\$92
Estudiantes internacionales, además de GIJ AMITOS y Capítulos Estudiantiles SMIG   Students	\$500	\$25

- Asociados de AMITOS, SMIG, ITA, ISSMGE y de asociaciones internacionales con quienes se tienen convenios de cooperación.
- Members of AMITOS, SMIG, ITA, ISSMGE and international associations with whom AMITOS and SMIG have cooperation agreements

## Patrocinio • Sponsor

**\$11,000.00 MXN (+IVA) | \$550 USD (+tax)**

- 3 inscripciones | 3 registrations
- Logo en los boletines digitales del Simposio | Logo in the digital newsletters of the Symposium
- Video de menos de 3min para presentarlo en los descansos, coffee break, durante los 3 días del evento | Video of less than 3 min to present it in the breaks, coffee break, during the 3 days of the event

## Temas • Topics

- **General overview of the sprayed concrete**
- **Applications in soils and rocks – case studies**
- **Design of the structure**
- **Mix design, tests and quality control**
- **Recent developments**
- **Importance of training and certification issues**
- **Conclusion & closure**

**zoom**

La Plataforma será Zoom y el idioma será inglés con traducción simultánea inglés-español-inglés.

The platform will be Zoom and the language will be English with simultaneous English-Spanish-English translation.

Más información • more information: [amitos@amitos.org](mailto:amitos@amitos.org)





# Programa técnico • Technical schedule

The objective of this training session is to present a global overview of the development and use of sprayed concrete in soil and rock tunnelling. The training will provide all the necessary information for a good design, quality control and application of sprayed concrete with references to interesting case studies. The course will highlight the latest improvements in spraying equipment and technology. Certification issues for nozzlelemen will be also presented.

## 1st October | Day 1

### Opening and session 1: 8:45-13:00 Mexico City Time

08:45 - 09:00	Opening of the training event
09:00 - 10:45	Chap 1: General overview of the sprayed concrete
09:00 - 09:45	Historical background and global description / <b>Tom MELBYE/</b>
<b>P1</b>	<ul style="list-style-type: none"><li>• Early developments and equipment</li><li>• Evolution</li><li>• Reinforcements and fibres</li></ul>
09:45 - 10:30	Overview of sprayed concrete methodology / <b>Catherine LARIVE/</b>
<b>P2</b>	<ul style="list-style-type: none"><li>• Wet and dry processes</li><li>• Selection criteria</li></ul>
10:30 - 10:45	Questions & Answers
<b>10:45 - 11:15</b>	<b>Coffee Break</b>
11:15 - 13:00	Chap 2: Applications in soils and rocks - case studies
11:15 - 12:00	Application in rock tunnelling / <b>Karl Gunnar HOLTER/</b>
<b>P3</b>	<ul style="list-style-type: none"><li>• Early protection</li><li>• Support in conventional tunnelling</li><li>• Waterproofing and final lining</li></ul>
12:00 - 12:45	Application in soil tunnelling / <b>Nasri MUNFAH/</b>
<b>P4</b>	<ul style="list-style-type: none"><li>• Early protection</li><li>• Support in conventional tunnelling</li><li>• Waterproofing and final lining</li></ul>
12:45 - 13:00	Questions & Answers

## 2nd October | Day 2

### Opening and session 2: 9:00-13:00 México City Time

09:00 - 10:45	Chap 3: Design of the structure
09:00 - 09:45	Main design principles / <b>David OLIVEIRA/</b>
<b>P5</b>	<ul style="list-style-type: none"><li>• Behaviour characteristics</li><li>• Codes and design tools</li><li>• Fibre reinforced concrete</li><li>• Fire behaviour</li></ul>

09:45 - 10:30	Example of design of a fibre reinforced concrete / <b>David OLIVEIRA/</b>
<b>P6</b>	<ul style="list-style-type: none"><li>• Design steps</li><li>• Fire behaviour</li></ul>
10:30 - 10:45	Questions & Answers
<b>10:45 - 11:15</b>	<b>Coffee Break</b>
11:15 - 13:00	Chap 4: Mix design, tests and quality control
11:15 - 12:00	Basics of the mix design / <b>Marc JOLIN/</b>
<b>P7</b>	<ul style="list-style-type: none"><li>• Basics of the mix design</li></ul>
12:00 - 12:45	Laboratory tests and onsite controls / <b>Nicolas LECLERE/</b>
<b>P8</b>	<ul style="list-style-type: none"><li>• Hold points and critical control points</li><li>• Suitability tests</li><li>• Internal and independent inspection during the works</li></ul>
12:45 - 13:00	Questions & Answers

## 3rd October | Day 3

### Opening and session 3: 9:00-13:45 México City Time

09:00 - 10:45	Chap 5: Recent developments
09:00 - 09:45	New equipment and technologies / <b>Ross DIMMOCK/</b>
<b>P9</b>	<ul style="list-style-type: none"><li>• Automation and robotisation</li><li>• Perspective for sustainable solutions</li></ul>
09:45 - 10:30	New developments / <b>Nick CHITTENDEN/</b>
<b>P10</b>	<ul style="list-style-type: none"><li>• Waterproofing</li><li>• Sprayed concrete as a final lining</li></ul>
10:30 - 10:45	Questions & Answers
<b>10:45 - 11:15</b>	<b>Coffee Break</b>
11:15 - 13:00	Chap 6: Importance of training and certification issues
11:15 - 12:00	The training steps and tools / <b>Benedikt LINDLAR/</b>
<b>P11</b>	
12:00 - 12:45	Certification scheme for Nozzel operator / <b>Michael KOMPATSCHER/</b>
<b>P12</b>	
12:45 - 13:30	Testing and performance criteria EN standard / <b>Benoit de RIVAZ/</b>
<b>P13</b>	
13:30 - 13:45	Questions & Answers
13:45	Conclusion & closure